

Te 804 Electronic Controller

Service, Operation & Technical Information Manual



WARNING! Technical descriptions and data given in this document are accurate, to the best of our knowledge, but can be subject to change without prior notice so no liabilities for errors, omissions or contingencies arising there from are accepted. Moreover, the TE804 should be set up and used by trained personnel and, in any case, in compliance to current installation standards, to avoid damages or safety hazards.

1. OPERATING PROCEDURES FOR AUTOMATIC CONTROL PANEL

[Warning!] Carefully study the instructions of your automatic control panel before starting your Genset set, so you will be able to operate your Genset safely.

[Warning!] Before starting your generator, check that there are no obstructions around it.

[Caution!] When starting the Genset the first time or after a long storage, let the engine warm up at least 5 minutes. This prolongs the life of the Genset.

[Warning!] The automatic control panel should only be set up and operated by trained personnel. Local codes must be followed in order to avoid equipment damage, and /or personal injury up to and including death.

[Caution!] Always check that the technical data printed on the nameplate corresponds to your specific requirements.

These products have been manufactured to minimize RFI that could damage or interfere with equipment.

Note: Due to a constant drive to improve the product through research and development, all procedures, specifications and equipment are subject to change without notice.

1.1 OPERATING PROCEDURES - GENERAL -

- Trained personnel should do programming of the control panel.
- Any programming done to the control panel should be performed with the Engine off and the load disconnected.
- Electrical connections must be carried out in compliance with local codes. AC cables, particularly, must be sized and placed so that the cable does not attain temperatures over 50° C Ambient temperature.
- It is necessary to check that cables have not loosened at the respective terminals and to remove any dust or other materials that have fouled the control panel during installation. The cleaning must be done by means of a vacuum, avoiding blowing dust into the control panel with air.
- Connections to the terminal board must be made using a cable of correct cross section, per electric diagram.
- To open the control panel front door use the special key supplied with the control panel. Only trained personnel should have access to this key.
- To protect from electric shocks and any atmospheric discharges, it is necessary to provide adequate earthen ground.

1.2 TECHNICAL TERM DEFINITION

Refer to the following definitions whenever these terms are mentioned in the manual:

Set-up: This is the set up of the controller. This is done before or during the installation of the Genset. There are three different menus in order to have access to the parameters setting and relative data. All operating times and calculations that affect the system functioning can be set up and the parameters are stored in a permanent memory.

Only trained personnel can reach this function and it is password protected.

Starting Cycles: The sequence of diesel Genset starting is as follows: First glow plugs are energized (programmable duration), and then the fuel solenoid valve is activated. After these two steps the control panel enters into a start interval (programmable duration), alternating with intervals of cool down (programmable duration). Once the engine is on, the starting attempts stop immediately.

The sequence of gaseous Genset starting is as follows: First the gas valve is activated; for the first starting attempt primer is energized. The Electronic Ignition is energized at the same time as the gas

valve; to avoid over-speed alarm RPM governor (this device is described in Appendix B) is energized after a time delay (after cranking). After these steps the control panel enters into a start interval (programmable duration), alternating with intervals of cool down (programmable duration). Once the engine is on, the starting attempts stop immediately.

Genset Stopping Procedure: The transfer switch opens and the Genset continues to run for a cool down period (programmable) at the end of which the fuel solenoid valve or the gas valve + Electronic Ignition + rpm governor are switched off and the engine stops. In case of emergency stop, the above-mentioned procedure takes place without considering the cool down time.

Engine On: The engine is considered on when the “engine ON” signal, which comes out of the engine alternator battery charger, exceeds the programmed value. Its led shows the engine-on signal. For safety reason generator output voltage is also monitored to verify that the engine is running.

Alarms On: Oil pressure and high temperature alarms are enabled after a delay time (programmable) greater than the engine-on signal time. The “engine ON” led flashing indicates the engine is on but the alarms are not enabled, and becomes on steady when the engine is running and the alarms are enabled. During the stopping cycle, the alarms are disabled and the fuel solenoid valve close simultaneously.

Utility-Off: The utility-off signal occurs when the utility voltage / frequency is out of the fixed limits (lower than the minimum fixed values or higher than the maximum fixed values) and remains in that state longer than the programmable time. This causes the transfer switch to transfer to the emergency position (after the Generating set has started and met requirements).

Utility-On: In the same way, the utility-on signal occurs when (as a programmable time is exceeded) the voltage / frequency are inside the fixed limits. The transfer switch function will depend on the selected operating procedure.

Generator-On: Generator-On signal works as the utility-on signal described above. The Voltages / Frequencies and delay intervals are independent.

Utility/Genset and Generator/Utility Switching: The remote control switches between the utility and Genset. A delay time occurs to avoid simultaneous connections.

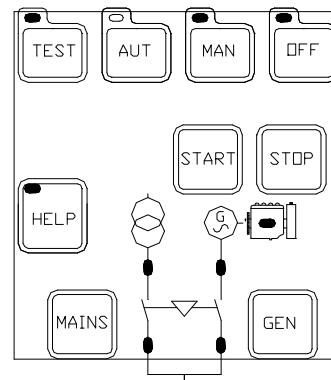
1.3 OPERATING MODES

Note: Please refer to Te804 controller instructions if you need more information.

The digital controller has 4 different modes:

- Reset
- Automatic
- Manual
- Test

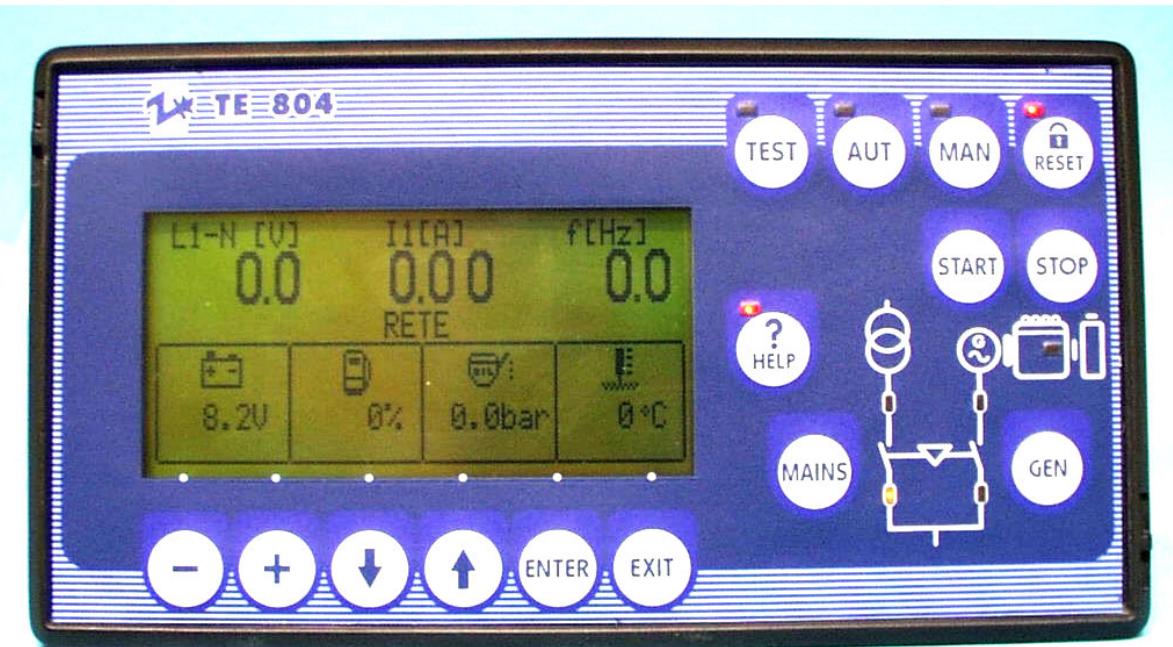
You select the mode you need by pressing the corresponding button and its LED lights up. It is always possible to skip from one operating procedure to another.



Warning! For safety reasons, on controller power-up, the operating Mode will always be RESET.

When one of the four operating Mode LED's is flashing, it indicates that the unit is being controlled by a supervision system (remote control).

2. Te 804 Controller Instructions for HS and Master GU Series



2.1

KEYBOARD

HELP key – The illuminated LED means a help message is available. By pressing the key, a help message concerning the current operation is displayed.

ENTER and EXIT keys - Press ENTER to confirm operations or to enter the menu. Press EXIT to refuse an operation or to exit a menu and help message.

“ \downarrow ” and “ \uparrow ” **arrow keys** – Press these keys to shift to the different pages of data display or to select parameters.

“-” and “+” **keys** – Press these keys to display alternative data of the selected data page or to modify the parameters.

OFF/RESET, MAN, AUT and TEST keys – Press these keys to select the operating mode. The illuminated LED indicates the selected operating mode; if it is flashing, remote control is active.

START and STOP keys – These keys work in MAN operating mode only, to start and stop the engine. By quickly pressing the START key, one start attempt takes place; by keeping the START key pressed, the duration of the start attempts can be extended. The flashing LED of the engine symbol denotes engine started, with alarms inhibited; and is constantly on at the end of the alarms inhibition time. The engine can be stopped using the OFF/RESET key.

MAINS and GEN keys – They are enabled only in MAN operating mode only, they are used to control the ATS and switch the load from utility to generator and vice versa. The illuminated Leds of the utility and generator symbols indicate the respective voltages are within preset limits. The illuminated Leds of the changeover symbols indicate the actual closing of switching devices; when flashing, there is a incorrect feed-back signal for the actual closing or opening of the switching devices.

2.2 LCD SCREEN

The LCD shows data and information in graphic and alphanumeric forms. Press the “ \downarrow ” or “ \uparrow ” keys to view the data pages. Press the “-” or “+” keys to see alternative data on the same page. Te804 is set to return to the main page 60 seconds after the last key was pressed.

2.3 POWER-UP

At power-up, Te804 is automatically set to OFF/RESET mode. The option to return to the mode present prior to power down can be enabled in the program section.

2.4 OPERATING MODES: RESET, MAN, AUT and TEST

RESET: In reset mode, the controls are not operational. The engine can not operate. If the utility is present, the load will default to the utility. When changing modes with the engine running from TEST, AUT or MAN to the OFF/RESET mode the engine is immediately stopped and the alarms are reset. If the cause of the alarm is still present, it can not be reset and will continue to be displayed on the LCD display. The LCD display will continue to show measures as well as any valid alarms.

AUTOMATIC: In the Automatic mode the Genset starts when the utility voltage goes out of limits and its respective control switch is off. After the (programmed) delay, Utility remote control switch gets switched off and the Genset start cycle begins.

When the Genset is running and its voltage / frequency are within the (programmed) limits, the Genset remote control switch closes. The Genset will continue operating until the utility voltage is restored. Once the utilities are within (programmed) limits for the (programmed) time, the remote control switches exchange position, and the Genset carries out the stop cycle.

When the Genset is running, however, it can always be stopped by means of the RESET or STOP buttons. In automatic procedure both the remote start and stop are enabled.

MANUAL: The engine can be manually started or stopped using the START and STOP keys. The ATS can only be switched by holding down on the Manual key and then pressing the MAINS or the GEN keys. Keeping the key pressed for an extended time can prolong the preset starting time. Keeping the Stop key pressed for more than 6 seconds will result in the fuel valve being disabled for 4 minutes.

The start button begins the start cycle while the stop button begins the stop cycle.

After pushing the stop button you can stop it from beginning the stop cycle by immediately pushing the start button.

TEST: In test mode the Genset begins the start cycle (even if the utility is present). If the Utility power drops out while the Genset is in test mode the controller will over ride this function and switch the Generator to the load. Once the Utility voltage returns, the load will stay on the generator. If the auto mode is enabled, the controller will transfer the load to the Utility and will start the stop cycle of the generator.

It is possible to program the controller so that the load will be transferred from utility to Genset even if the utility is present.

2.5 AUTOMATIC TEST (EXERCISE)

The automatic test (EXERCISE) is a periodic check that is carried out by the control panel at programmed intervals. If the control panel is in automatic mode and the automatic test has been enabled, the Genset runs for a fixed period before it stops.

It is possible to program the controller so that the load will be transferred from utility to Genset even if the utility is present. It is also possible to program the controller in order to carry out the automatic test even if the external (remote) stop is activated.

2.6 PERIODIC MAINTENANCE INTERVAL

By means of set up, a periodic maintenance interval, expressed in hours, is set. When the working hours reach the fixed amount, the display shows a message noting maintenance is required. The System will not shut down and continues to work normally.

It is possible to reset anytime the remaining hours (Command Menu). This means that periodic maintenance can be carried out before the end of the fixed amount of working hours.

2.7 WORKING HOUR CALCULATION

As the Engine runs the working minutes are counted. The calculation, expressed in hours, can be shown on the display. The calculation continues even in case of disconnection of the electrical input and cannot be set to zero by the user.

2.8 ALARMS

When an alarm arises, the alarm is displayed in the lower section of the display. In case of two alarms or more, they are individually shown in sequence. A help message is available for every alarm, to assist in locating the possible alarm source. Alarm conditions can be reset by means of the OFF/RESET key; this is to prevent any unintentional engine starting during alarm conditions. If the alarm does not reset, this means the cause of the alarm is still present. During event-log sessions and set-up operations, no alarms are displayed.

2.9 ALARM PROPERTIES

Eight different properties can be assigned to each user alarm, including **User Alarms**:

- Alarm enabled. If not enabled, the alarm will not work.
- Retentive alarm. The alarm is latched even if the cause of the alarm is removed.
- Global alarm. It activates the output assigned to this function.
- Siren. It activates the output assigned to this function.
- Immediate Engine shutdown.
- Shutdown with Engine cool-down.
- Active only with engine running.
- Modem auto-call. A modem connection is performed according to the modality scheduled by preset parameters.

All these properties are preset to a default value for the specific applications (Diesel or Gaseous Generating set). To change these properties, enter the ADVANCED MENU, find the ALARMS menu, press the “ \downarrow ” or “ \uparrow ” key to select the alarm, press the “-” or “+” key to select the property and then press the ENTER key to enable or disable the property. Press the EXIT key to return to the previous menu.

[Warning!] Changing the Alarm Properties could result in equipment damage or personal injury and loss of warranty coverage.

2.10 SET-UP VIA KEYBOARD

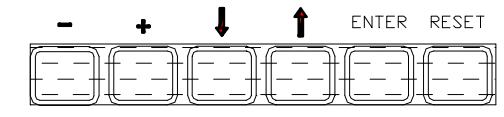
There are three different menus in order to have access to the parameters setting and related data.

- User's menu:** Access the setting of those parameters that final user can modify. To enter the menu, press the OFF/RESET key for 5 seconds then release it.
- Commands menu:** Access to data resetting, parameter copy and their restore. It is necessary to access this menu for maintenance hours reset.
To enter the menu, press the OFF/RESET key and simultaneously the ENTER key for 5 seconds and then release them. Press the EXIT key to exit the menu.
- Advanced menu:** Access to all parameters setting. This menu is protected by a password.
To enter the menu, keep the OFF/RESET key pressed, then push, in the following sequence, “-” key twice, “+” key three times and “ \downarrow ” key four times then finally release the OFF/RESET key.



[Warning!] Only trained personnel should do the parameters set-up. Changing the Set up Values could result in equipment damage or personal injury and loss of warranty coverage.

Moving within the menu: After entering the menu, press the “ \downarrow ” or “ \uparrow ” keys to select a sub-menu (or a command in the case of “Commands menu”). Press the ENTER key to access parameter setting (or to perform the command). Press “ \downarrow ” or “ \uparrow ” keys to select the parameter and press “-” or “+” to modify it. Press the EXIT key to close the sub-menu and push it again to close the set-up.



Data safety copy: A safety copy of the adjustable keyboard set-up data can only be made in Te804 flash memory. The same data can be restored, whenever required, to Te804 work memory. The commands and data restore of the safety copy are available in the Commands menu.

The set-up can be more easily done/ modified via PC connected to Te804 RS-232 port. Using the software set-up, it is possible to transfer parameters (previously set) from Te804 to the PC and vice versa.

In addition to the parameters set-up, with the PC it is possible to define:

- Help text of the alarms, descriptions and help text of the **User Alarms**.
- All the data related to the curve characteristic of the pressure, temperature, fuel level sensors and generator thermal protection.
- Custom logo, that appears on the display at power-up and at set-up exit via keypad.
- An information page, where one can write information, data, characteristics, etc., concerning a certain application.

2.12 RECOMMENDATIONS ABOUT SET-UP

Safety copy of set-up data: It is highly recommended to save the set-up data on the PC hard disk and make a safety copy on floppy disk because of the large amounts of data involved with Te804 set-up. Moreover, it is advisable to update set-up data files each time data parameters are adjusted via keyboard. Bear in mind that a safety copy of adjustable keyboard set-up data can only be made in Te804 flash memory. This same data can be restored, whenever required, to Te804 work memory. The commands of safety copy and data restore are available in the commands menu.

2.13 DIGITAL PROGRAMMABLE INPUTS AND OUTPUTS

All the outputs and a part of the inputs are assigned (set) to specific functions depending on specific application. See the table in the following pages. To change the function assignment, enter INPUTS or OUTPUTS menu, press the “ \downarrow ” or “ \uparrow ” keys to select the exact input or output and press “-“ or “+“ keys to select the function.

The following properties can be assigned to each input:

- NO (Normally Open), command at the input contact closing or NC (Normally closed), command at the input contact opening
- Delay before the contact closes
- Delay before the contact opens

To set these properties, enter the INPUTS menu, press the “ \downarrow ” or “ \uparrow ” key to select the exact input, press the ENTER key to access the parameter properties, press the “ \downarrow ” or “ \uparrow ” key to select the parameter property and then “-“ or “+“ key to change it. Press the EXIT key to return to the previous menu.

2.14 COMMANDS MENU

To enter the menu, press the OFF/RESET key and simultaneously the ENTER key for 5 seconds and then release them. Press the EXIT key to exit the menu.

C01 Energy meter reset
C02 Maintenance reset
C03 Engine hour meter reset
C04 Starting counter reset
C05 Parameters to default
C06 Save parameters to flash
C07 Load parameters from flash
C08 Rent hours reset

2.14.a HIDDEN COMMANDS

Maintenance hour counter setting

To set the maintenance counter, press the OFF/RESET key and subsequently, ENTER and “↓” keys for 5s; after that release them. Set the hours using the “-” or “+” key and press the EXIT key to store and exit.

RPM / W ratio

When the engine is running, press START + ENTER keys to self-configure the RPM / W ratio value.

2.15 ADVANCED MENU

To enter the menu, keep the OFF/RESET key pressed, then push, in the following sequence, “-” key twice, “+” key three times and “↓” key four times then finally release the OFF/RESET key.

“01” UTILITY (LANGUAGES)	Default HS	Default GU	Range
D= Diesel Units, G= Gaseous Units,	HS= Home StandBy	GU= Masters GU Series	
P0101 Languages	English	English	English/Italian/ French/German/ Spanish
P0102 Year	-	-	1989-2089
P0103 Month	-	-	1-12
P0104 Day of the month	-	-	1-31
P0105 Day of the week	-	-	1-7
P0106 Hour	-	-	0-23
P0107 Minutes	-	-	0-59
P0108 Seconds	-	-	0-59
P0109 Clock setting at power-up	ON	OFF	OFF/ON
P0110 Default page return (s)	60	60	OFF/5-999
P0111 Display contrast (%)	50	50	0-100

“02” GENERAL	Default HS	Default GU	Range
P0201 CT ratio	20.0	GU26L=10 GU30J=16 GU42J=16 GU65J=20 GU85J=30 GU105J=30 GU125J=50	1.0-2000.0
P0202 VT ratio	1.0	1.0	1.0-500.0
P0203 Wiring configuration	L1-L2-L3-N	L1-L2-L3-N	3N-3-2N-1N
P0204 Rated voltage (V)	208	208	100-50000
P0205 Frequency (Hz)	60	60	50/60
P0206 RPM / “W” ratio	D=4.444 G=29.464		0.001-50.000
P0207 Rated engine speed (RPM)	D=1800 G=2400	1800	750-3600
P0208 Unit of measure	°F/psi	°F/psi	°C/bar °F/psi
P0209 MAINS/GEN interlock (s)	0.5	0.5	0.0-60.0
P0210 M/G feedback delay (s)	5	5	1-60
P0211 RESET mode at power-up	ON	ON	OFF/ON
P0212 Siren time (s)	OFF	5	OFF/1-60
P0213 Siren before starting (s)	OFF	5	OFF/1-60

Caution! The calculation system of the TE804 can handle power value up to 999 000 000 VA (999MVA).

“03” BATTERY	Default HS	Default GU	Range
P0301 Battery voltage (V)	12	12	12/24
P0302 MAX voltage limit (%)	130	130	110-140%
P0303 MIN voltage limit (%)	75	75	60-100%
P0304 MIN/MAX voltage delay (s)	10	10	0-30

“04” ENGINE STARTING	Default HS	Default GU	Range
P0401 Alternator voltage engine started (V)	6	6	OFF/3-30
P0402 Generator voltage engine started (%)	20	20	OFF/10-100%
P0403 Generator frequency engine started (%)	20	20	OFF/10-100%
P0404 “W” signal engine started(RPM)	20	20	OFF/10-100%
P0405 Glow-plugs preheating (s)	8	8	OFF/1-60
P0406 Starting attempts number	5	5	1-10
P0407 Attempts starting time(s)	8	8	1-30
P0408 Pause between starting(s)	10	10	1-30
P0409 Aborted starting & subsequent(s)	3	3	OFF/1-20
P0410 Deceleration time (s)	OFF	OFF	OFF/1-180
P0411 Cooling time (s)	10	10	1-3600
P0412 Stop magnet time (s)	OFF	OFF	OFF/1-60
P0413 Gas valve delay (s)	OFF	OFF	OFF/1-10
P0414 Priming time (s)	D=OFF G=1	OFF	OFF/1-10
P0415 Choke valve time (s)	OFF	OFF	OFF/1-10
P0416 Choke OFF limit (%)	5	5	0-100

“05” ENGINE CONTROL		Default HS	Default GU	Range
P0501 Pressure sensor selection	VEGLIA	VEGLIA	(1)	
P0502 Temperature sensor selection	VEGLIA	VEGLIA	(1)	
P0503 Fuel sensor selection	D=DATCOM G=OFF	DATCOM	(1)	
P0504 MIN pressure warning	11.6	11.6	0.1-180.0	
P0505 MIN pressure limit	4.4	4.4	0.1-180.0	
P0506 MAX temperature warning	203	203	40-285	
P0507 MAX temperature limit	230	230	40-285	
P0508 MIN fuel warning (%)	20	20	0-100	
P0509 MIN fuel level (%)	10	10	0-100	
P0510 Alarms inhibition at starting (s)	8	8	1-30	
P0511 MAX “W” speed limit (%)	110	110	100-120	
P0512 MAX “W” speed delay (s)	3	3	3-20	
P0513 MIN “W” speed limit (%)	90	90	80-100	
P0514 MIN “W” speed delay (s)	5	5	0-600	

“06” MAINS CONTROL		Default HS	Default GU	Range
P0601 MIN voltage limit (%)	90	90		70-100
P0602 MIN voltage delay (s)	5	5		0-600
P0603 MAX voltage limit (%)	110	110		100-120
P0604 MAX voltage delay (s)	5	5		0-600
P0605 MAINS into limits delay(s)	10	10		1-600
P0606 MIN/MAX hysteresis limits (%)	3.0	3.0		0.0-5.0
P0607 MAX asymmetry limit (%)	15	15		5-20
P0608 MAX asymmetry delay (s)	5	5		0-600
P0609 MAX frequency limit (%)	103	103		100-120/OFF
P0610 MIN frequency limit (%)	97	97		OFF/80-100
P0611 MIN/MAX frequency delay (s)	5	5		0-600
P0612 MAINS control OFF/internal/external)	INTERNAL	INTERNAL		OFF/INT/EXT
P0613 MAINS control in RESET/OFF mode	OFF	OFF		OFF/ON/OFF+GLOB/ON+GLOB
P0614 MAINS control in MAN mode	OFF	OFF		OFF/ON/OFF+GLOB/ON+GLOB

Note! The phase sequence control can be enabled by means of the alarm properties table menu.

“07” GEN CONTROL		Default HS	Default GU	Range
P0701 MIN voltage limit (%)	90	90		70-100
P0702 MIN voltage delay (s)	5	5		0-600
P0703 MAX voltage limit (%)	110	110		100-120
P0704 MAX voltage delay (s)	5	5		0-600
P0705 Generator into limits delay (s)	10	10		0-600
P0706 MIN/MAX hysteresis limits (%)	3.0	3.0		0.0-5.0
P0707 MAX asymmetry limit (%)	15	15		5-20
P0708 MAX asymmetry delay (s)	5	5		0-600
P0709 MAX frequency limit (%)	105	110		100-120/OFF
P0710 MAX frequency delay (s)	3	0		0-200
P0711 MIN frequency limit (%)	95	95		OFF/80-100
P0712 MIN frequency delay (s)	5	5		0-600
P0713 Gen. Control (OFF/internal/external)	INTERNAL	INTERNAL		OFF/INT/EXT

“08” GENERATOR PROTECTION	Default HS	Default GU	Range
P0801 Rated generator current (A)	D=76.3 NG=62.5 LPG=69	GU26L=85 GU30J=94 GU42J=132 GU65J=212 GU85J=257 GU105J=344 GU125J=386	OFF/5-10000
P0802 MAX current limit (%)	250	250	100-500/OFF
P0803 MAX current delay (s)	3	3	0.0-60.0
P0804 Thermal protection curve selection	P3	P3	(1)
P0805 Generator protection reset time (s)	20	20	0-5000

“09” EXERCISE AND MAINTENANCE	Default HS	Default GU	Range
P0901 EXERCISE beginning day	MONDAY	MONDAY	1-7
P0902 EXERCISE beginning hour (h)	12	12	00-23
P0903 EXERCISE beginning Minutes (m)	0	0	00-59
P0904 Interval between EXERCISES (days)	07	07	1-30
P0905 EXERCISE duration (m)	OFF	OFF	OFF/1-60
P0906 EXERCISE with load	OFF	OFF	OFF/ON
P0907 Maintenance interval (h)	50	50	OFF/1-999
P0908 EXERCISE with remote / external stop	OFF	OFF	OFF/ON

“10” COMUNICATION PORT	Default HS	Default GU	Range
P1001 Serial port address	01	01	1-99
P1002 RS-232 baud rate	9600	9600	OFF/1200-38400
P1003 RS-485 baud rate	OFF	OFF	OFF/1200-38400
P1004 Modem channel	RS232	RS232	RS232/RS485

“11” MISCELLANEOUS	Default HS	Default GU	Range
P1101 Max engine power starting	OFF	OFF	OFF/ON
P1102 Engine start threshold (kW)	0	0	0-9999
P1103 Engine start threshold delay (s)	0	0	0-999
P1104 Engine stop threshold (kW)	0	0	0-9999
P1105 Engine stop threshold delay (s)	0	0	0-999
P1106 Dummy load	OFF	OFF	OFF/ON
P1107 Dummy load ON (kW)	0	0	0-9999
P1108 Dummy load ON delay (s)	0	0	0-999
P1109 Dummy load OFF (kW)	0	0	0-9999
P1110 Dummy load OFF delay (s)	0	0	0-999
P1111 Rent hours (h)	OFF	OFF	0-60000
P1112 Mode select	NORMAL	NORMAL	Normal/EJP/EJP-T/SCR
P1113 Start motor delay	25	25	0-99
P1114 Changeover delay	5	5	0-30
P1115 Changeover block	OFF	OFF	OFF/ON

"12" PROGRAMMABLE INPUTS		Default HS	Default GU	Range
P1201 Input terminal 8.1		EMERG. STOP	EMERG. STOP	(1)
8.1 Contact type		NC	NC	NO/NC
8.1 Opening delay (s)		0.0	0.0	0.0-6000.0
8.1 Closing delay (s)		0.0	0.0	0.0-6000.0
P1202 Input terminal 8.2		REMOTE STAR.	REMOTE STAR.	(1)
8.2 Contact type		NO	NO	NO/NC
8.2 Opening delay (s)		0.0	0.0	0.0-6000.0
8.2 Closing delay (s)		0.0	0.0	0.0-6000.0
P1203 Input terminal 8.3		DISABLED	DISABLED	(1)
8.3 Contact type		NO	NO	NO/NC
8.3 Opening delay (s)		0.0	0.0	0.0-6000.0
8.3 Closing delay (s)		0.0	0.0	0.0-6000.0
P1204 Input terminal 8.4		UA1	DISABLED	(1)
8.4 Contact type		NO	NO	NO/NC
8.4 Closing delay (s)		0.0	0.0	0.0-6000.0
8.4 Opening delay (s)		0.0	0.0	0.0-6000.0
P1205 Input terminal 8.5		UA2	DISABLED	(1)
8.5 Contact type		NO	NO	NO/NC
8.5 Closing delay (s)		0.0	0.0	0.0-6000.0
8.5 Opening delay (s)		0.0	0.0	0.0-6000.0
P1206 Input terminal 8.6		D=DISABLED G=Remote Stop	REMOTE STOP	(1)
8.6 Contact type		NO	NO	NO/NC
8.6 Closing delay (s)		0.0	0.0	0.0-6000.0
8.6 Opening delay (s)		0.0	0.0	0.0-6000.0
P1207 Input terminal 8.7		DISABLED	DISABLED	(1)
8.7 Contact type		NO	NO	NO/NC
8.7 Closing delay (s)		0.0	0.0	0.0-6000.0
8.7 Opening delay (s)		0.0	0.0	0.0-6000.0
P1208 Input terminal 8.8		DISABLED	DISABLED	(1)
8.8 Contact type		NO	NO	NO/NC
8.8 Closing delay (s)		0.0	0.0	0.0-6000.0
8.8 Opening delay (s)		0.0	0.0	0.0-6000.0
P1209 Input terminal 8.9		DISABLED	DISABLED	(1)
8.9 Contact type		NO	NO	NO/NC
8.9 Closing delay (s)		0.0	0.0	0.0-6000.0
8.9 Opening delay (s)		0.0	0.0	0.0-6000.0
P1210 Input terminal 9.1		WATER TEMP.	WATER TEMP.	(1)
9.1 Contact type		NO	NO	NO/NC
9.1 Closing delay (s)		0.0	0.0	0.0-6000.0
9.1 Opening delay (s)		0.0	0.0	0.0-6000.0
P1211 Input terminal 9.2		OIL PRESSURE	OIL PRESSURE	(1)
9.2 Contact type		NC	NC	NO/NC
9.2 Closing delay (s)		1.0	1.0	0.0-6000.0
9.2 opening delay (s)		1.0	1.0	0.0-6000.0
P1212 Input terminal 9.3		FUEL LEVEL	FUEL LEVEL	(1)
9.3 Contact type		NO	NO	NO/NC
9.3 Closing delay (s)		0.0	0.0	0.0-6000.0
9.3 Opening delay (s)		0.0	0.0	0.0-6000.0

(1) See the list of the available functions in the "Programmable inputs" table.

Programmable inputs – (Function...)

Disable
Oil pressure
Engine temperature

Fuel level
Emergency stop
Remote stop
Remote starting
Remote starting without cooling
Automatic test start
Generator protection
Supervision Off
Setup block
External MAINS control
External GEN control
Automatic changeover
MAINS contactor feed-back
GEN contactor feed-back
Fuel tank too empty
Fuel tank empty
Fuel tank filled
Fuel tank too full
User's alarm 1
User's alarm 2
User's alarm 3
User's alarm 4

“13” PROGRAMMABLE OUTPUTS	Default HS	Default GU	Range
P1301 Output terminal 5.3 (Function...)	GLOBAL ALARM	GLOBAL ALARM	(1)
P1302 Output terminal 6.2 (Function...)	D=SIREN G=PRIMING VALVE	SIREN	(1)
P1303 Output terminal 6.3 (Function...)	D=GLOW-PLUGS G= N/A	GLOW-PLUGS	(1)
P1304 Output terminal 6.5 (Function...)	D=FUEL VALVE G= GAS VALVE	FUEL VALVE	(1)
P1305 O-A.6	Disabled		
P1306 O-A.8	Disabled		

(1) See the list of the available functions in the “Programmable outputs” table.

Programmable outputs – (Function...)

Disable
Global alarm
Fuel solenoid valve
Siren
Decelerator
Stop magnet
Glow-plugs
Gas valve
Air valve
Priming valve
Filling pump
Dummy load
A1-A43 and UA1-UA4 alarms

Alarm properties ⇒

List of the alarms for HSD

	Alarm enabled	Latched alarm	Global alarm	Siren	Engine shutdown	Engine cool down	Active with engine running	Modem auto call
A01 Engine temperature warning (analog sensor)	X		X	X			X	X
A02 High engine temperature (analog sensor)	X	X	X	X	X		X	X
A03 Temperature analog sensor fault			X	X				X
A04 High engine temperature (digital sensor)	X	X	X	X	X		X	X
A05 Oil pressure warning (analog sensor)	X		X	X			X	X
A06 Low oil pressure (analog sensor)	X	X	X	X	X		X	X
A07 Pressure analog sensor fault	X		X	X				X
A08 Low oil pressure (digital sensor)	X	X	X	X	X		X	X
A09 Pressure digital sensor fault	X	X	X	X				X
A10 Fuel level warning(analog sensor)	X		X	X				X
A11 Low fuel level(analog sensor)	X		X	X				X
A12 Level analog sensor fault	X	X	X	X				X
A13 Low fuel level(digital sensor)	X		X	X				X
A14 High battery voltage	X	X	X	X				X
A15 Low battery voltage	X	X	X	X				X
A16 Inefficient battery	X	X	X	X			X	X
A17 Charger alternator failure	X	X	X	X	X		X	X
A18 "W" signal failure	X	X	X	X			X	X
A19 Low engine "W" speed			X	X	X	X	X	X
A20 High engine "W" speed			X	X	X	X	X	X
A21 Starting failure	X	X	X	X	X			X
A22 Emergency stop	X	X	X	X	X			X
A23 Unexpected stop	X	X	X	X	X			X
A24 Engine stop failure	X	X	X	X	X			X
A25 Low generator frequency	X	X	X	X	X	X	X	X
A26 High generator frequency	X	X	X	X	X		X	X
A27 Low generator voltage	X	X	X	X	X	X	X	X
A28 High generator voltage	X	X	X	X	X		X	X
A29 Generator asymmetry	X	X	X	X	X	X	X	X
A30 Generator short-circuit	X	X	X	X	X	X	X	X
A31 Generator overload	X	X	X	X	X	X	X	X
A32 External generator protection tripping			X	X	X	X		
A33 Incorrect generator phase sequence			X	X	X	X		
A34 Incorrect utility phase sequence		X						
A35 Wrong system frequency setting	X							
A36 Generator contactor failure			X	X	X			
A37 Utility contactor failure			X	X	X			
A38 Maintenance requested			X	X	X			
A39 System error								
A40 Fuel transfer too empty					X	X		
A41 Fuel transfer too full					X	X		
A42 Rent hours exhausted					X	X		
UA1 User's alarm 1								
UA2 User's alarm 2 (Dirty air filter)	X	X	X	X			X	X
UA3 User's alarm 3								
UA4 User's alarm 4								

Alarm properties ⇒

List of the alarms for HSG

	Alarm enabled	Latched alarm	Global alarm	Siren	Engine shutdown	Engine cool down	Active with engine running	Modem auto call
A01 Engine temperature warning (analog sensor)	X		X	X			X	X
A02 High engine temperature (analog sensor)	X	X	X	X	X		X	X
A03 Temperature analog sensor fault		X	X	X				X
A04 High engine temperature (digital sensor)	X	X	X	X	X		X	X
A05 Oil pressure warning (analog sensor)	X		X	X			X	X
A06 Low oil pressure (analog sensor)	X	X	X	X	X		X	X
A07 Pressure analog sensor fault	X		X	X				X
A08 Low oil pressure (digital sensor)	X	X	X	X	X		X	X
A09 Pressure digital sensor fault	X	X	X	X				X
A10 Fuel level warning(analog sensor)			X	X				X
A11 Low fuel level(analog sensor)			X	X				X
A12 Level analog sensor fault		X	X	X				X
A13 Low fuel level(digital sensor)			X	X				X
A14 High battery voltage	X	X	X	X				X
A15 Low battery voltage	X	X	X	X				X
A16 Inefficient battery		X	X	X				X
A17 Charger alternator failure	X	X	X	X	X		X	X
A18 "W" signal failure	X	X	X	X			X	X
A19 Low engine "W" speed		X	X	X	X		X	X
A20 High engine "W" speed		X	X	X	X		X	X
A21 Starting failure	X	X	X	X	X			X
A22 Emergency stop	X	X	X	X	X			X
A23 Unexpected stop	X	X	X	X	X			X
A24 Engine stop failure	X	X	X	X	X			X
A25 Low generator frequency	X		X	X	X	X		X
A26 High generator frequency	X	X	X	X	X		X	X
A27 Low generator voltage	X	X	X	X	X	X	X	X
A28 High generator voltage	X	X	X	X	X	X	X	X
A29 Generator asymmetry	X	X	X	X	X	X	X	X
A30 Generator short-circuit	X	X	X	X	X		X	X
A31 Generator overload	X	X	X	X	X	X	X	X
A32 External generator protection tripping	X	X	X	X	X	X	X	X
A33 Incorrect generator phase sequence	X	X	X	X	X	X	X	X
A34 Incorrect utility phase sequence		X						
A35 Wrong system frequency setting	X							
A36 Generator contactor failure	X	X	X	X				X
A37 Utility contactor failure	X	X	X	X				X
A38 Maintenance requested	X	X	X	X				X
A39 System error	X							
A40 Fuel transfer too empty				X	X			
A41 Fuel transfer too full				X	X			
A42 Rent hours exhausted				X	X			
UA1 User's alarm 1								
UA2 User's alarm 2 (Dirty air filter)	X	X	X	X			X	X
UA3 User's alarm 3								
UA4 User's alarm 4								

Alarm properties ⇒

List of the alarms for GU

	Alarm enabled	Latched alarm	Global alarm	Siren	Engine shutdown	Engine cool down	Active with engine running	Modem auto call
A01 Engine temperature warning (analog sensor)	X		X	X			X	X
A02 High engine temperature (analog sensor)	X	X	X	X	X		X	X
A03 Temperature analog sensor fault		X	X	X				X
A04 High engine temperature (digital sensor)	X	X	X	X	X		X	X
A05 Oil pressure warning (analog sensor)	X		X	X			X	X
A06 Low oil pressure (analog sensor)	X	X	X	X	X		X	X
A07 Pressure analog sensor fault	X	X	X	X				X
A08 Low oil pressure (digital sensor)	X	X	X	X	X		X	X
A09 Pressure digital sensor fault	X	X	X	X				X
A10 Fuel level warning(analog sensor)			X	X				X
A11 Low fuel level(analog sensor)			X	X				X
A12 Level analog sensor fault			X	X	X			X
A13 Low fuel level(digital sensor)	X		X	X				X
A14 High battery voltage	X	X	X	X				X
A15 Low battery voltage	X	X	X	X				X
A16 Inefficient battery	X	X	X	X			X	X
A17 Charger alternator failure	X	X	X	X	X		X	X
A18 "W" signal failure	X	X	X	X			X	X
A19 Low engine "W" speed			X	X	X	X	X	X
A20 High engine "W" speed			X	X	X	X	X	X
A21 Starting failure	X	X	X	X	X			X
A22 Emergency stop	X	X	X	X	X			X
A23 Unexpected stop	X	X	X	X	X			X
A24 Engine stop failure	X	X	X	X	X			X
A25 Low generator frequency	X	X	X	X	X	X	X	X
A26 High generator frequency	X	X	X	X	X		X	X
A27 Low generator voltage	X	X	X	X	X	X	X	X
A28 High generator voltage	X	X	X	X	X		X	X
A29 Generator asymmetry	X	X	X	X	X	X	X	X
A30 Generator short-circuit	X	X	X	X	X	X	X	X
A31 Generator overload	X	X	X	X	X	X	X	X
A32 External generator protection tripping			X	X	X	X		
A33 Incorrect generator phase sequence			X	X	X	X		
A34 Incorrect utility phase sequence			X					
A35 Wrong system frequency setting	X							
A36 Generator contactor failure			X	X	X			
A37 Utility contactor failure			X	X	X			
A38 Maintenance requested			X	X	X			
A39 System error								
A40 Fuel transfer too empty				X	X	X		
A41 Fuel transfer too full				X	X	X		
A42 Rent hours exhausted				X	X	X		
A43 Low Radiator Level								
UA1 User's alarm 1								
UA2 User's alarm 2								
UA3 User's alarm 3								
UA4 User's alarm 4								

2.19 TECHNICAL CHARACTERISTICS

Power supply	
Battery rated voltage	12 VDC
Voltage range	9...15.6 VDC
Minimum voltage at the starting	6.7VDC
Maximum current consumption	320mA at 12VDC
Stand-by current	150mA at 12VDC
Micro interruption immunity	200ms
Digital inputs	
Input type	Negative
Current input	$\leq 10\text{mA}$
Input "low" voltage	$\leq 1.5\text{V}$ (typical 2.9V)
Input "high" voltage	$\geq 3.5\text{V}$ (typical 4.3V)
Input delay	$\geq 50\text{ms}$
Speed input "W"	
Input type	AC coupling
Voltage range	5...50Vpp
Frequency range	40...2000Hz
Engine running input for pre-excited generator (D+)	
Voltage range	0...40VDC
Maximum input current	12mA
Maximum voltage at +D terminal	12 VDC (battery voltage)
Pre-excitation current	170mA 12VDC
Relay output 4.1-4.2 / 4.3-4.4 terminals (voltage free)	
Contact type	1 NC for utility + 1 NO for generator
Rated voltage	250VAC (440VAC max)
Rated current at 250VAC	8A AC1 (2A AC15)
Relay output 5.3-5.4-5.5 terminals (voltage free)	
Contact type	1 changeover
Rated voltage	250VAC max
Rated current at 250VAC	8A AC1 (2A AC15)
Relay output 6.2 / 6.3 / 6.4 / 6.5 terminals (+ battery voltage output)	
Contact type	1 NO
Rated voltage	30VDC
Rated current at 30VDC	5A DC1
Analog inputs	
Pressure sensor current	20mA max
Temperature sensor current	7mA max
Level sensor current	10mA max
Analog ground voltage	-0.5V...+0.5V
Voltage inputs	
Maximum rated voltage	480VAC L-L (277VAC L-N)
Measuring range	50...620V L-L (358VAC L-N)
Frequency range	45...65Hz
Measuring method	True RMS

Measuring input impedance	>1.1MΩ L-L (>570kΩ L-N)
Wiring mode	1, 2 or 3 phases, with or without neutral
Current inputs	
Rated current I_e	5A
Measuring range	0.02...6A
Measuring method	True RMS
Overload capacity	+20% I_e
Overload peak	50A for 1 second
Power consumption	<0.3VA
Measuring characteristics (-10...+45°C)	
Voltage	±1% ±1digit
Frequency	±0.2% ±1digit
Current	±1% ±1digit
Power	±2% ±1digit
Energy	±2% ±1digit
Ambient operating conditions	
Operating temperature	-20...+60°C
Storage temperature	-30...+80°C
Relative humidity	<90%
Maximum pollution degree	3
Reference standards	
IEC/EN 60255-6, IEC 60664-1, IEC/EN 61000-4-5, IEC/EN 61000-4-4, IEC/EN 61000-4-3, IEC/EN 61000-4-6, IEC/EN 60255-22-2, IEC/EN 55011, IEC/EN 60255-21-2, IEC/EN 60068-2-6 (LROS-Lloyd's Register Of Shipping), IEC/EN 60068-2-52 (RINA-Italian Naval Register), IEC/EN 60028-2-61 and IEC/EN 61010-1.	

3. CONNECTIONS INSTRUCTIONS (HS SERIES ONLY)

3.1 LOW WYE (DOUBLE STAR) CONNECTIONS 120/208V 3PH (Factory Default)

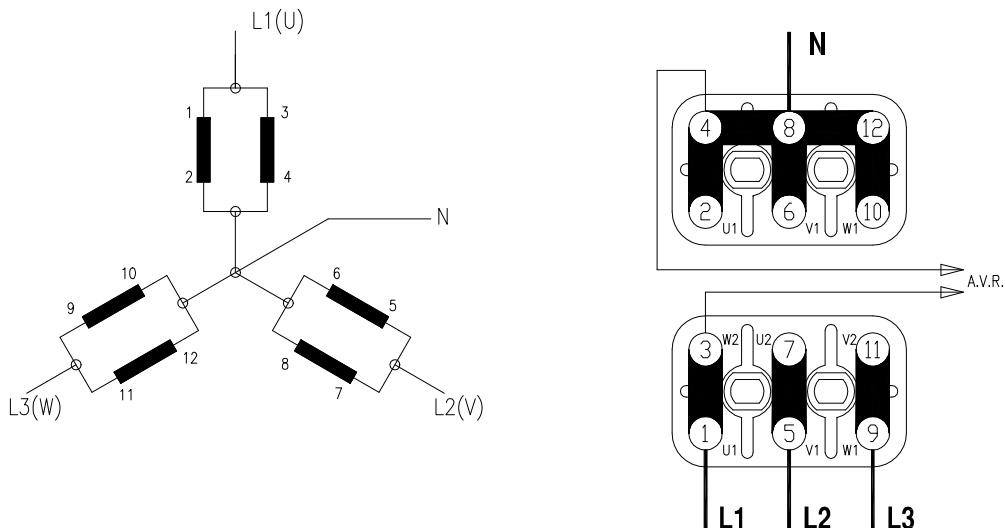
This is the “on factory set” connection.

In order to verify /remake this connection it is necessary to proceed according to the following points.

Do not run the generating set before all these steps have been checked / done.

- **[Warning!]** Internal connections modification can only be made by trained personnel. Local codes must be followed in order to avoid equipment damage, and /or personal injury up to and including death.
- **[Warning!]** Always check that the Genset voltage/connection corresponds to your specific requirements.
- Electrical connections must be carried out in compliance with local codes. AC cables, particularly, must be sized and placed so that the cable does not attain temperatures over 50° C Ambient temperatures.
- It is necessary to check that cables have not loosened at the respective terminals.
- To open the control panel front door use the special key supplied with the control panel. Only trained personnel should have access to this key.

3.1.1 GENERATOR TERMINAL BOARD CONNECTIONS:



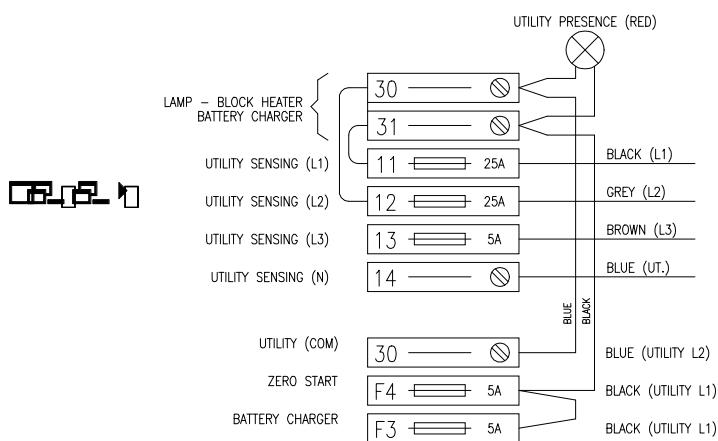
Verify / modify internal terminal board connections as per above drawing.

3.1.2 ELECTRICAL PANEL CONNECTIONS (SEE B0172.dwg, B0192.dwg)

To avoid damages to

- Utility presence lamp
- Zero start device (block heater)
- Battery charger
- Other devices with maximum voltage = 240V

it is necessary to maintain voltage between terminals 30 and 31 of internal terminal board between 208V and 240V. For this reason, in case of 120/208V connection it is necessary to connect terminal 31 with terminal 11 (L1) and terminal 30 with terminal 12 (L2) ($V_{30-31} = 208V$). All above devices will be supply between phase-phase.



As soon as you connect utility verify input voltage on above devices: it must not exceed 240V.

13.1.3 CONTROLLER SETUP

Following parameters have to be

adjusted – verified on controller set-up:

Menu	Parameter	Adjust to
M02 - General	P0203 – Wiring configuration	L1-L2-L3-N
	P0204 – Nominal voltage (V)	208 (or 220)
M08 – Generator Protection	P0801 – Nom. Gen Current (A)	See following table (Amax)

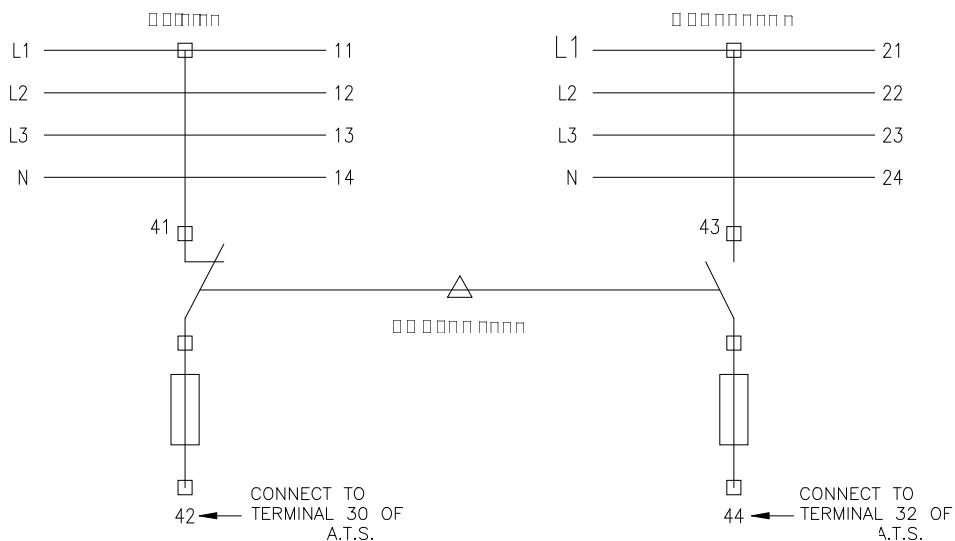
3.1.3 RATED POWER / CURRENT WITH DIFFERENT VOLTAGE

With low wye connection it is possible to obtain:

Voltage		HSD 22		HSG 20 (LPG)	
V _{LL}	V _{LN}	Amax	KVA max	Amax	KVA max
208	120	76.3	27.5	69.4	25

3.1.4 A.T.S. CONNECTIONS

Te804 controller can control an external A.T.S.: two contacts are available and connected as per following diagram.



[Warning!] Voltage between 42/44 and N is 120V.

Carefully verify compatibility with ATS. If necessary connect a transformer.

In case of use of an No Logic A.T.S. it is necessary to consider:

- Terminal 42 (UTILITY ON) has to be connected to terminal 30 of ATS
- Terminal 44 (GENSET ON) has to be connected to terminal 32 of ATS
- It is not necessary to use transformers

3.1.5 VOLTAGE ADJUSTMENT

Carefully start the generating set and:

- 2 Check ph-ph and ph-N voltage: values between phase has not to be different (max difference= 2%)
- 2 Quickly adjust output voltage on "VOLT" potentiometer on generator A.V.R.
- 2 If output voltage is not inside preset limits before the preset time expires, you will get an alarm.

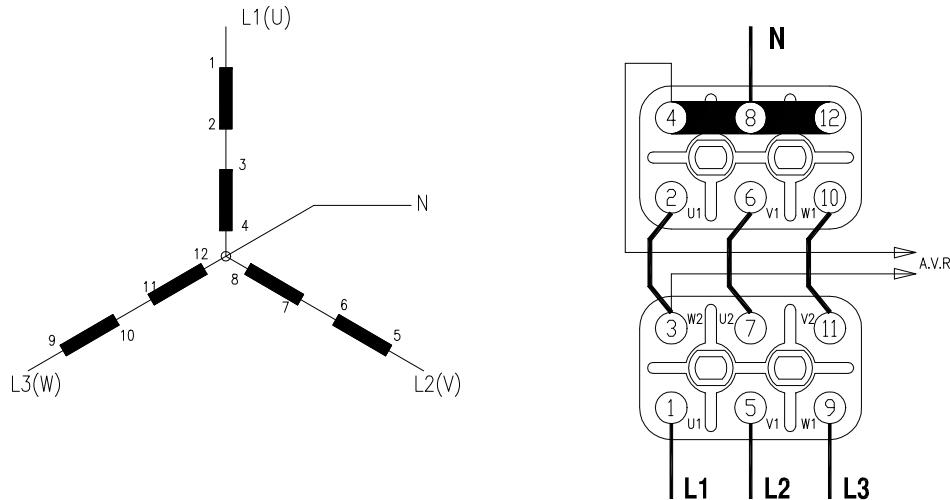
3.2 HIGH WYE (STAR) CONNECTIONS /240V-277/480V 3PH

In order to obtain this connection it is necessary to proceed according to the following points.

Do not run the generating set before all these steps have been done.

- ❑ **[Warning!]** Internal connections modification can only be made by trained personnel. Local codes must be followed in order to avoid equipment damage, and /or personal injury up to and including death.
- ❑ **[Warning!]** Always check that the Genset voltage/connection corresponds to your specific requirements.
- ❑ Electrical connections must be carried out in compliance with local codes. AC cables, particularly, must be sized and placed so that the cable does not attain temperatures over 50°C Ambient temperature.
- ❑ It is necessary to check that cables have not loosened at the respective terminals.
- ❑ To open the control panel front door use the special key supplied with the control panel. Only trained personnel should have access to this key.

3.2.1 GENERATOR TERMINAL BOARD CONNECTIONS:



Modify internal terminal board connections as per above drawing.

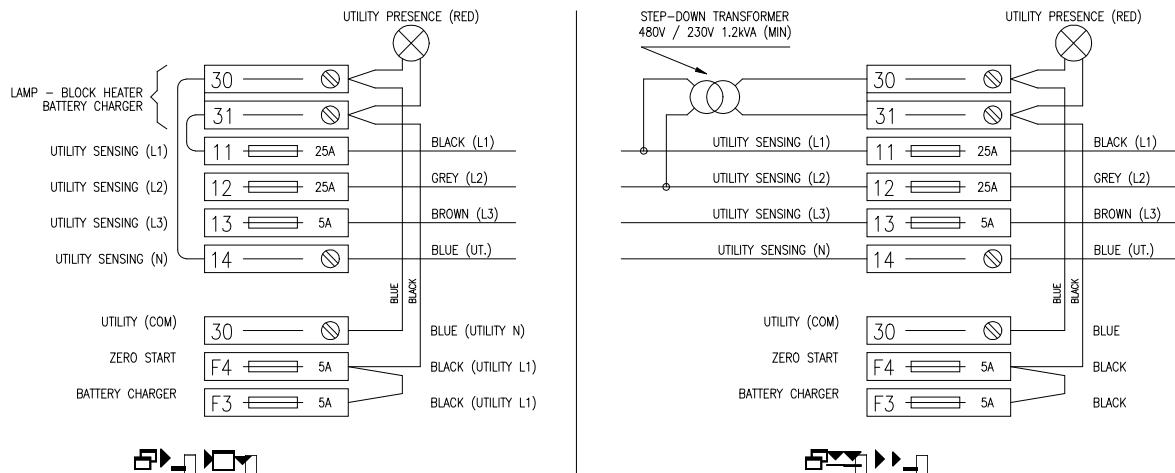
3.2.2 ELECTRICAL PANEL CONNECTIONS (SEE B0172.dwg, B0192.dwg)

In order to do not damage

- utility presence lamp
- zero start device (block heater)
- battery charger
- other devices with maximum voltage = 240V

it is necessary to maintain voltage between terminals 30 and 31 of internal terminal board between 208V and 240V. For this reason:

- in case of 240/416V it is necessary to connect terminal 30 with terminal 14 ($V_{30-31} = 240V$). All above devices will be supply between phase-neutral.
- in case of 254/440V – 266/460V - 277/480V it is necessary to connect a suitable step-down transformer (transformer rated power Minimum 1.2kVA)



As soon as you connect utility verify input voltage on above devices: it must not exceed 240V

3.2.3 CONTROLLER SETUP

Following parameters have to be adjusted – verified on controller set-up:

Menu	Parameter	Adjust to
M02 - General	P0203 – Wiring configuration	L1-L2-L3-N
	P0204 – Nominal voltage (V)	440, or 460, or 480)
M08 – Generator Protection	P0801 – Nom. Gen Current (A)	See following table (Amax)

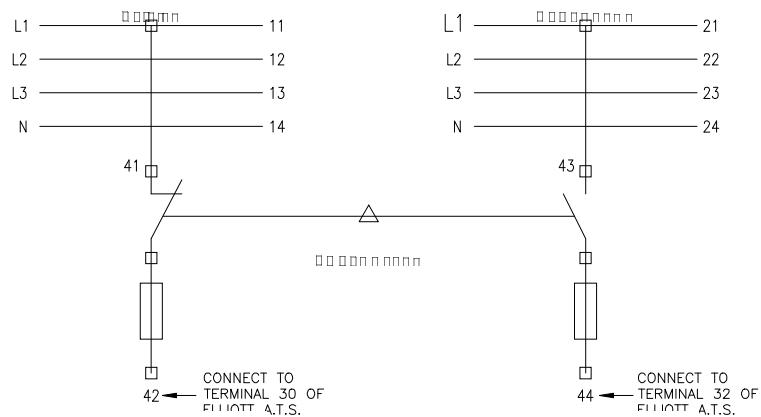
3.2.4 RATED POWER / CURRENT WITH DIFFERENT VOLTAGE

With high wye connection it is possible to obtain:

Voltage		HSD 22		HSG 20 (LPG)	
VLL	VLN	Amax	KVA max	Amax	KVA max
440	254	36.1	“	32.8	“
460	266	34.5	“	31.4	“
480	277	33.0	“	30.0	“

3.2.5 A.T.S. CONNECTIONS

Te804 controller can control an external A.T.S.: two contacts are available and connected as per following diagram.



[Warning!] Voltage between 42/44 and N is 277V (with 480V Ph-PH).

Carefully verify compatibility with ATS. If necessary connect a step-down transformer.

In case of use of an No Logic A.T.S. it is necessary to consider:

- Terminal 42 (UTILITY ON) has to be connected to terminal 30 of ATS
- Terminal 44 (GENSET ON) has to be connected to terminal 32 of ATS
- It is necessary to use step-down transformers to reduce voltage up to 120V

3.2.6 VOLTAGE ADJUSTMENT

Carefully start the generating set and:

1. Check ph-ph and ph-N voltage: values between phase have not to be different (max difference= 2%)
2. Quickly adjust output voltage on “VOLT” potentiometer on generator A.V.R.
3. If output voltage is not inside preset limits before the preset time expires, you will get an alarm.

3.3 DOG LEG (ZIG ZAG) CONNECTIONS 120/240V 1ph

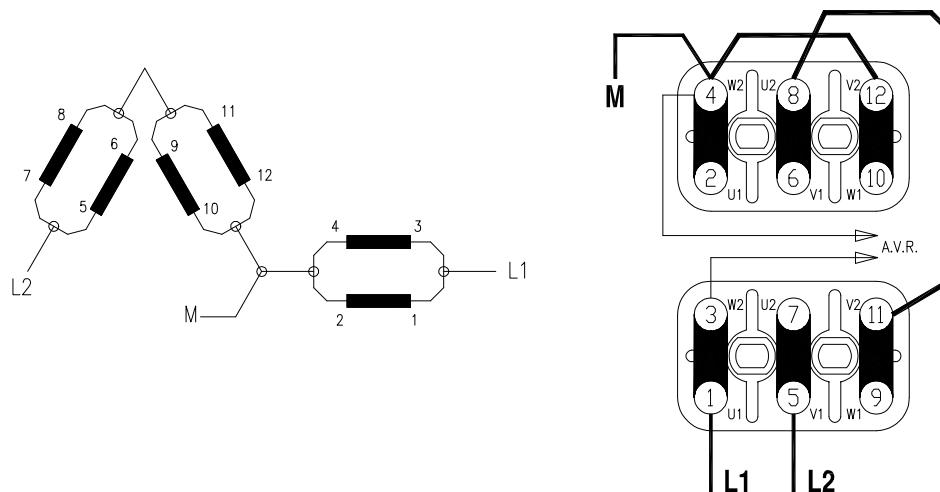
In order to obtain this connection it is necessary to proceed according to the following points. Do not run the generating set before all these steps have been done.

[Warning!] Internal connections modification can only be made by trained personnel. Local codes must be followed in order to avoid equipment damage, and /or personal injury up to and including death.

[Warning!] Always check that the Genset voltage/connection corresponds to your specific requirements.

- ❑ Electrical connections must be carried out in compliance with local codes. AC cables, particularly, must be sized and placed so that the cable does not attain temperatures over 50°C Ambient temperature.
- ❑ It is necessary to check that cables have not loosened at the respective terminals.
- ❑ To open the control panel front door use the special key supplied with the control panel. Only trained personnel should have access to this key.

3.3.1 GENERATOR TERMINAL BOARD CONNECTIONS:



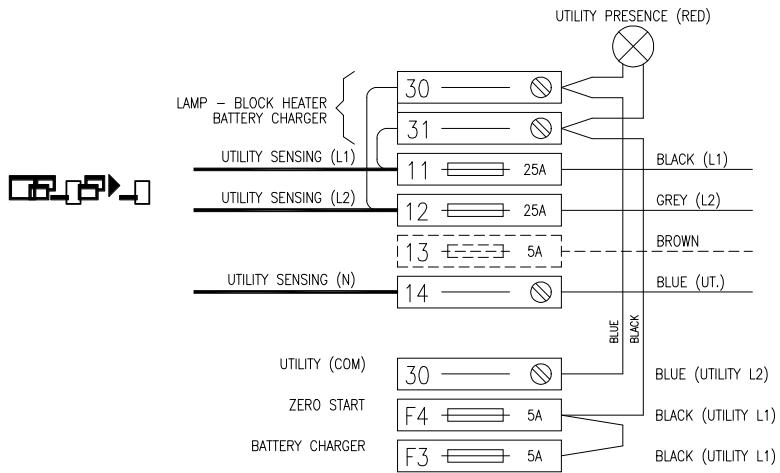
Modify internal terminal board connections as per above drawing.

3.3.2 ELECTRICAL PANEL CONNECTIONS (SEE B0172.dwg, B0192.dwg)

In order to do not damage

- Utility presence lamp
- Zero start device (block heater)
- Battery charger
- Other devices with maximum voltage = 240V

it is necessary to maintain voltage between terminals 30 and 31 of internal terminal board between 208V and 240V. For this reason, in case of 120/240V (1ph) connection it is necessary to connect terminal 31 with terminal 11 (L1) and terminal 30 with terminal 12 (L2) ($V_{30-31} = 240V$). All above devices will be supply between phase-phase.



As soon as you connect utility verify input voltage on above devices: it must not exceed 240V

3.3.3 CONTROLLER SETUP

Following parameters have to be adjusted – verified on controller set-up:

Menu	Parameter	Adjust to
M02 - General	P0203 – Wiring configuration	L1-N-L2
	P0204 – Nominal voltage (V)	240
M08 – Generator Protection	P0801 – Nom. Gen Current (A)	See following table (Amax)

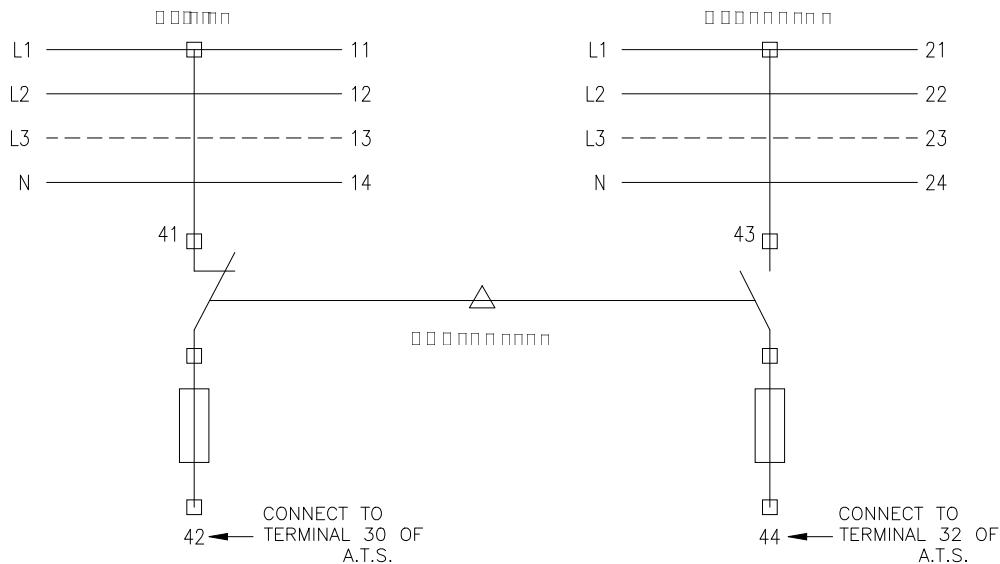
3.3.4 RATED POWER / CURRENT WITH DIFFERENT VOLTAGE

With dog-leg (zig-zag) connection it is possible to obtain:

Voltage		HSD 22		HSG 20 (LPG)	
V _{L1-L2}	V _{LN}	Amax	KW max	Amax	KW max
240	120	88	21	75	18

3.3.5 A.T.S. CONNECTIONS

Te804 controller can control an external A.T.S.: two contacts are available and connected as per following diagram.



[Warning!] Voltage between 42/44 and N is 120V.

Carefully verify compatibility with ATS. If necessary connect a transformer.

In case of use of an No Logic A.T.S. it is necessary to consider:

- Terminal 42 (UTILITY ON) has to be connected to terminal 30 of ATS
- Terminal 44 (GENSET ON) has to be connected to terminal 32 of ATS
- It is not necessary to use transformers

3.3.6 VOLTAGE ADJUSTMENT

Carefully start the generating set and:

1. Check ph-ph and ph-N voltage: values between phases-neutral has not to be different (max difference= 2%)
2. Quickly adjust output voltage on "VOLT" potentiometer on generator A.V.R
3. If output voltage is not inside preset limits before the preset time expires, you will get an alarm.

3.4 HIGH DELTA CONNECTIONS 240V 3ph - 120/240V 1ph

In order to obtain this connection it is necessary to proceed according to the following points.

Do not run the generating set before all these steps have been done.

[Warning!] Internal connections modification can only be made by trained personnel. Local codes must be followed in order to avoid equipment damage, and /or personal injury up to and including death.

[Warning!] Always check that the Genset voltage/connection corresponds to your specific requirements.

- Electrical connections must be carried out in compliance with local codes. AC cables, particularly, must be sized and placed so that the cable does not attain temperatures over 50° C Ambient temperatures.
- It is necessary to check that cables have not loosened at the respective terminals.
- To open the control panel front door use the special key supplied with the control panel. Only trained personnel should have access to this key.

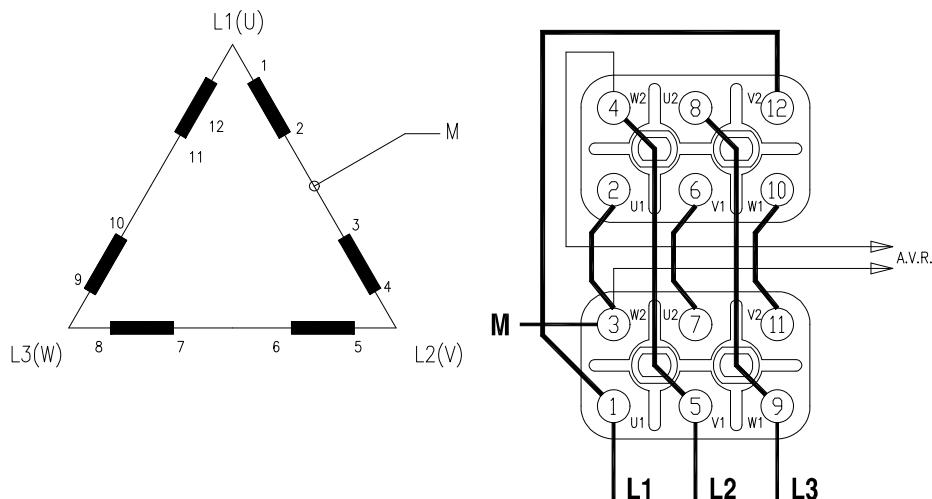
3.4.a HIGH DELTA CONNECTIONS 240V 3ph - 120/240V 1ph

In order to obtain this connection it is necessary to proceed according to the following points.

Do not run the generating set before all these steps have been done.

- ❑ **[Warning!]** Internal connections modification can only be made by trained personnel. Local codes must be followed in order to avoid equipment damage, and /or personal injury up to and including death.
- ❑ **[Warning!]** Always check that the Genset voltage/connection corresponds to your specific requirements.
- ❑ Electrical connections must be carried out in compliance with local codes. AC cables, particularly, must be sized and placed so that the cable does not attain temperatures over 50°C Ambient temperature.
- ❑ It is necessary to check that cables have not loosened at the respective terminals.
- ❑ To open the control panel front door use the special key supplied with the control panel. Only trained personnel should have access to this key.

3.4.1 GENERATOR TERMINAL BOARD CONNECTIONS:



Modify internal terminal board connections as per above drawing.

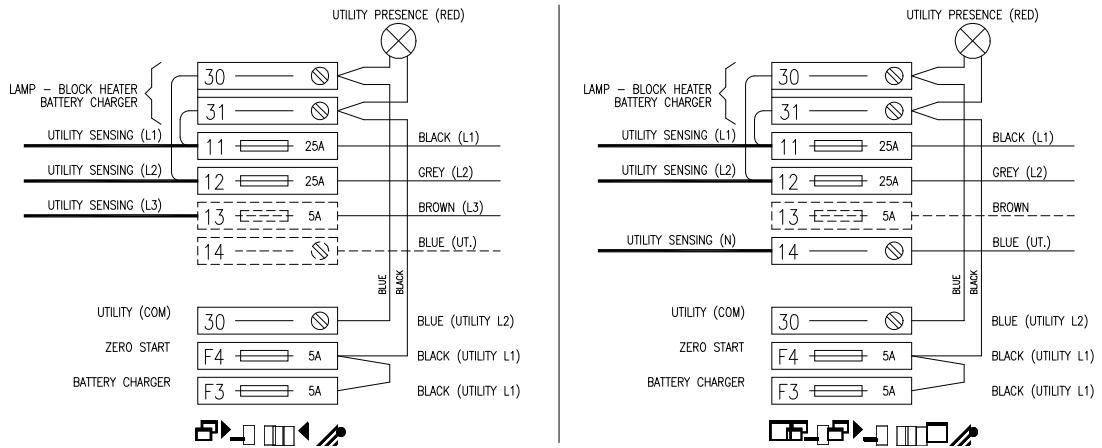
3.4.2 ELECTRICAL PANEL CONNECTIONS (SEE B0172.dwg, B0192.dwg)

In order to do not damage

- utility presence lamp
- zero start device (block heater)
- battery charger
- other devices with maximum voltage = 240V

it is necessary to maintain voltage between terminals 30 and 31 of internal terminal board between 208V and 240V.

For this reason, in case of this connection it is necessary to connect terminal 31 with terminal 11 (L1) and terminal 30 with terminal 12 (L2) ($V_{30-31} = 240V$). All above devices will be supply between phase-phase.



As soon as you connect utility verify input voltage on above devices: it must not exceed 240V

3.4.3 CONTROLLER SETUP

Following parameters have to be adjusted – verified on controller set-up:

Menu	Parameter	Adjust to
M02 – General	P0203 – Wiring configuration	240 3ph: L1-L2-L3 120/240V 1ph: L1-N-L2
	P0204 – Nominal voltage (V)	240
M08 – Generator Protection	P0801 – Nom. Gen Current (A)	See following table (Amax)

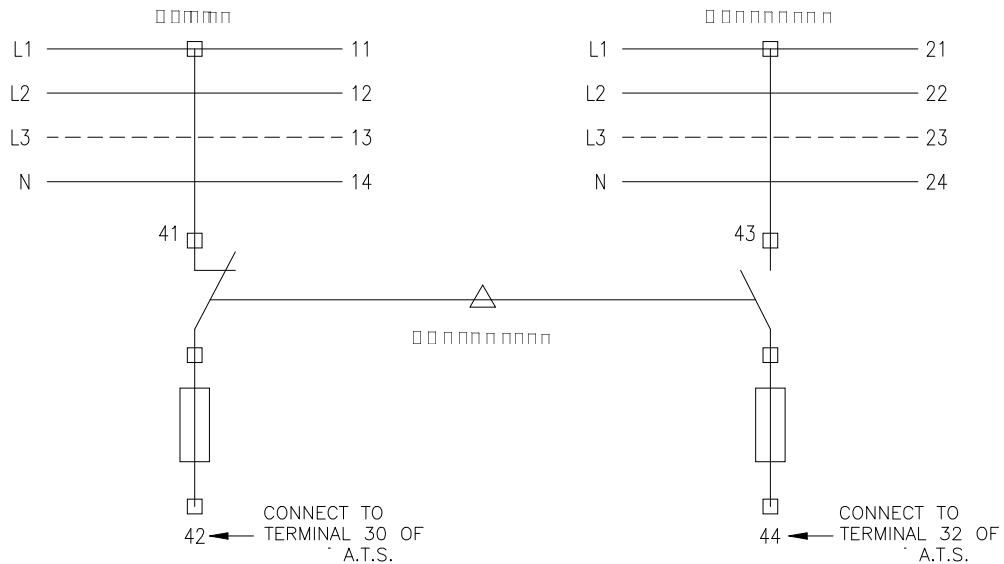
3.4.4 RATED POWER / CURRENT WITH DIFFERENT VOLTAGE

With high delta connection it is possible to obtain:

Voltage		HSD 22		HSG 20 (LPG)	
System	V	Amax	KVA max	Amax	KVA max
3ph L1-L2-L3	240	66.2	27.5	60.1	25
			KW max		KW max
1ph L1-N-L2	$V_{L1-L2}=240V$	88	21	75	18
L1-M	$V_{L1-M}=120V$	44	5.3	37	4.5

3.4.5 A.T.S. CONNECTIONS

Te804 controller can control an external A.T.S.: two contacts are available and connected as per following diagram.



[Warning!] Voltage between 42/44 and N is 120V.

Carefully verify compatibility with ATS. If necessary connect a transformer.

In case of use of a no logic A.T.S. it is necessary to consider:

- Terminal 42 (UTILITY ON) has to be connected to terminal 30 of ATS
- Terminal 44 (GENSET ON) has to be connected to terminal 32 of ATS
- it is not necessary to use transformers

3.4.6 VOLTAGE ADJUSTMENT

Carefully start the generating set and:

Check ph-ph and ph-N voltage: values between phase has not to be different (max difference= 2%)

Quickly adjust output voltage on "VOLT" potentiometer on generator A.V.R.

If output voltage is not inside preset limits before the preset time expires, you will get an alarm.

4 CONNECTIONS INSTRUCTIONS (GU SERIES ONLY)

4.1.0 LOW WYE (DOUBLE STAR) CONNECTIONS 120/208V 3PH (Factory Default)

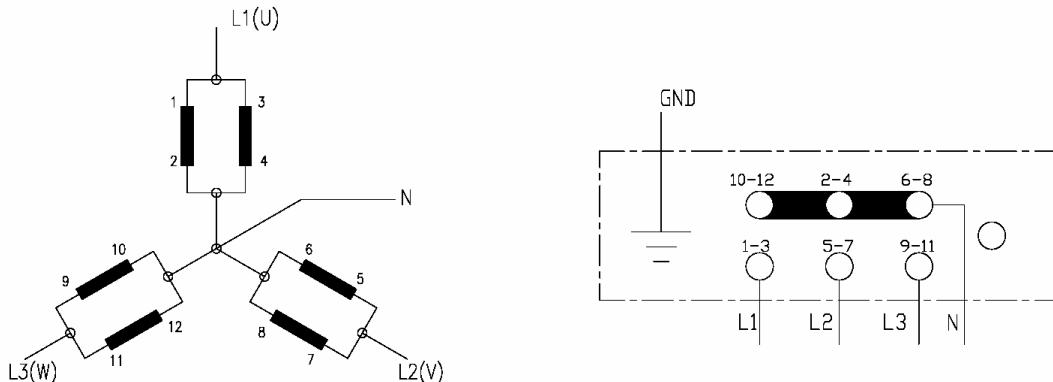
This is the “on factory set” connection.

In order to verify /remake this connection it is necessary to proceed according to the following points.

Do not run the generating set before all these steps have been checked / done.

- [Warning!]** Internal connections modification can only be made by trained personnel. Local codes must be followed in order to avoid equipment damage, and /or personal injury up to and including death.
- [Warning!]** Always check that the Genset voltage/connection corresponds to your specific requirements.
- Electrical connections must be carried out in compliance with local codes. AC cables, particularly, must be sized and placed so that the cable does not attain temperatures over 50° C Ambient temperatures.
- It is necessary to check that cables have not loosened at the respective terminals.
- To open the control panel front door use the special key supplied with the control panel. Only trained personnel should have access to this key.

4.1.1 GENERATOR TERMINAL BOARD CONNECTIONS:



Verify / modify internal terminal board connections as per above drawing.

4.1.2 CONTROLLER SETUP

Following parameters have to be adjusted – verified on controller set-up:

Menu	Parameter	Adjust to
M02 - General	P0203 – Wiring configuration	L1-L2-L3-N
	P0204 – Nominal voltage (V)	208
M08 – Generator Protection	P0801 – Nom. Gen Current (A)	See following table (Amax)

4.1.3 RATED POWER / CURRENT WITH DIFFERENT VOLTAGE

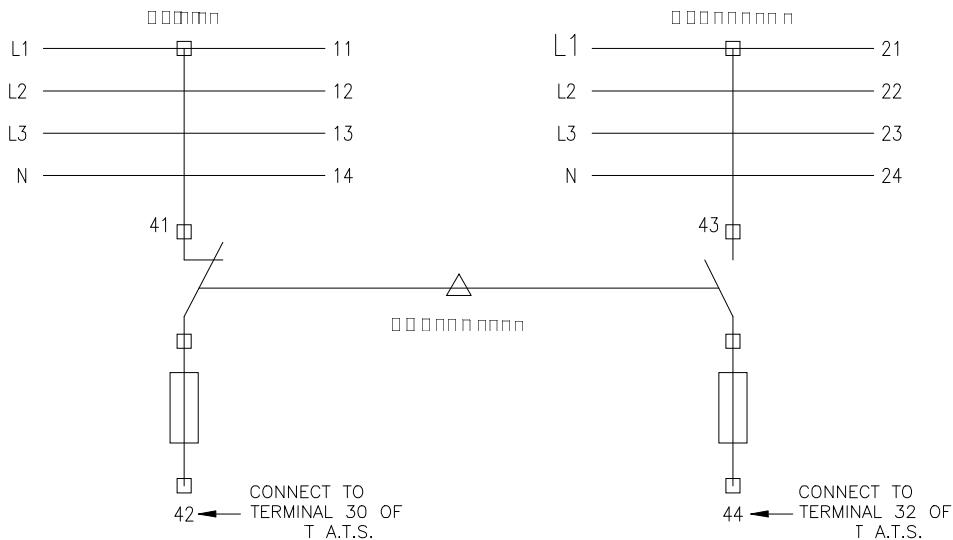
With low wye connection it is possible to obtain:

208 V _{LL} 120 V _{LN}	P0801 Amax	KVA max
GU26L	85	31
GU30J	94	34
GU42J	132	48

208 V _{LL} 120 V _{LN}	P0801 Amax	KVA max
GU65J	212	76
GU85J	257	93
GU105J	344	124
GU125J	368	139

4.1.4 A.T.S. CONNECTIONS

Te804 controller can control an external A.T.S.: two contacts are available and connected as per following diagram.



[Warning!] Voltage between 42/44 and N is 120V.

In case of use of an No Logic A.T.S. it is necessary to consider:

- Terminal 42 (UTILITY ON) has to be connected to terminal 30 of ATS
- Terminal 44 (GENSET ON) has to be connected to terminal 32 of ATS
-

4.1.5 VOLTAGE ADJUSTMENT

Carefully start the generating set and:

- Check ph-ph and ph-N voltage: values between phase has not to be different (max difference= 2%)
- Quickly adjust output voltage on "VOLT" potentiometer on generator A.V.R.
- If output voltage is not inside preset limits before the preset time expires, you will get an alarm.

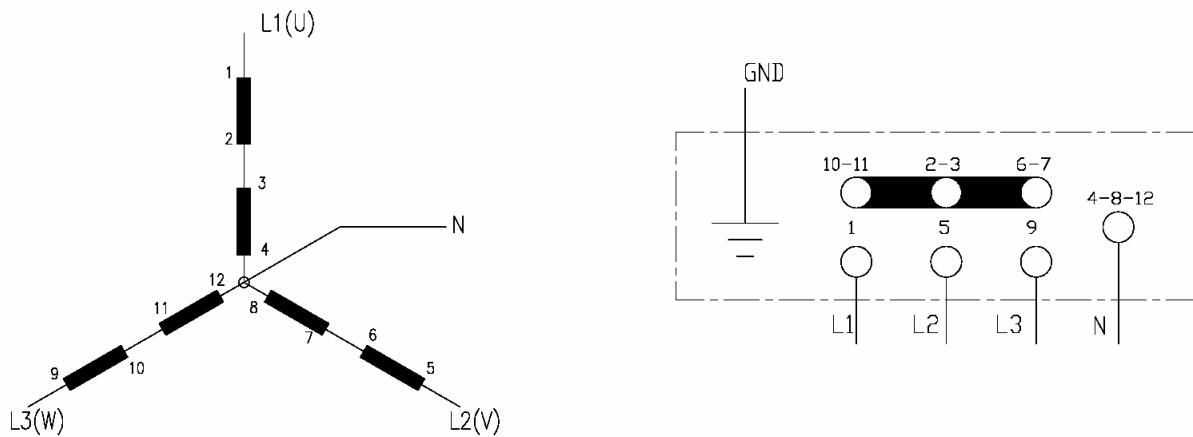
4.2 HIGH WYE (STAR) CONNECTIONS /240V-277/480V 3PH

In order to obtain this connection it is necessary to proceed according to the following points.

Do not run the generating set before all these steps have been done.

- [Warning!]** Internal connections modification can only be made by trained personnel. Local codes must be followed in order to avoid equipment damage, and /or personal injury up to and including death.
- [Warning!]** Always check that the Genset voltage/connection corresponds to your specific requirements.
- Electrical connections must be carried out in compliance with local codes. AC cables, particularly, must be sized and placed so that the cable does not attain temperatures over 50°C Ambient temperature.
- It is necessary to check that cables have not loosened at the respective terminals.
- To open the control panel front door use the special key supplied with the control panel. Only trained personnel should have access to this key.

4.2.1 GENERATOR TERMINAL BOARD CONNECTIONS:



Modify internal terminal board connections as per above drawing.

When the System is set up for 254/440V – 266/460V - 277/480V it is necessary to use a standard 2 wire logic ATS

4.2.2 CONTROLLER SETUP

Following parameters have to be adjusted – verified on controller set-up:

Menu	Parameter	Adjust to
M02 - General	P0203 – Wiring configuration	L1-L2-L3-N
	P0204 – Nominal voltage (V)	440, or 460, or 480)
M08 – Generator Protection	P0801 – Nom. Gen Current (A)	See following table (Amax)

4.2.3 RATED POWER / CURRENT WITH DIFFERENT VOLTAGE

High wye connection Controller values :

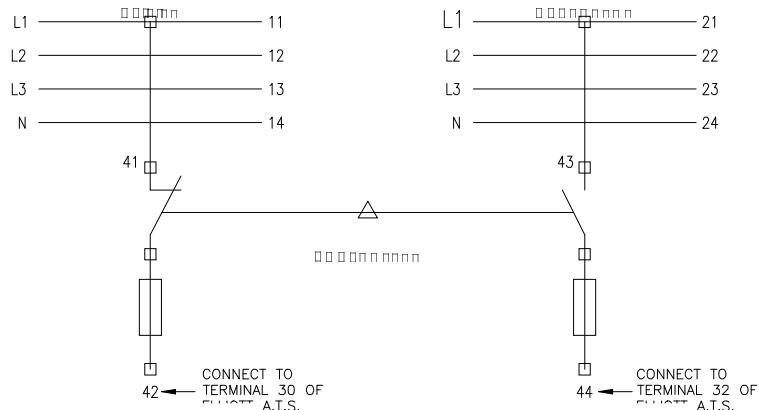
440 V _{LL} 254 V _{LN}	P0801 Amax	KVA max
GU26L	40	31
GU30J	44	34
GU42J	62	48
GU65J	100	76
GU85J	121	93
GU105J	162	124
GU125J	182	139

460 V _{LL} 266 V _{LN}	PO801 Amax	KVA max
GU26L	38	31
GU30J	42	34
GU42J	59	48
GU65J	95	76
GU85J	116	93
GU105J	155	124
GU125J	174	139

480 V _{LL} 277 V _{LN}	PO801 Amax	KVA max
GU26L	37	30.8
GU30J	41	33.8
GU42J	57	47.5
GU65J	92	76.3
GU85J	111	92.5
GU105J	149	123.8
GU125J	167	138.8

4.2.4 A.T.S. CONNECTIONS

Te804 controller can control an external A.T.S.: two contacts are available and connected as per following diagram.



- When the System is configured for this voltage it is necessary to use a Standard 2 wire ATS.

4.2.5 VOLTAGE ADJUSTMENT

Carefully start the generating set and:

Check ph-ph and ph-N voltage: values between phase have not to be different (max difference= 2%)

Quickly adjust output voltage on "VOLT" potentiometer on generator A.V.R.

If output voltage is not inside preset limits before the preset time expires, you will get an alarm.

4.3 DOG LEG (ZIG ZAG) CONNECTIONS 120/240V 1ph

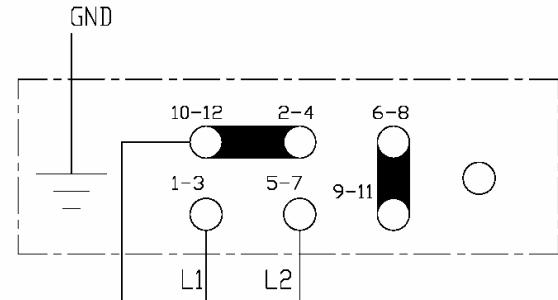
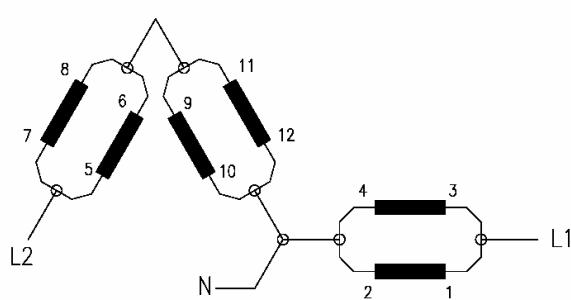
In order to obtain this connection it is necessary to proceed according to the following points.
Do not run the generating set before all these steps have been done.

[Warning!] Internal connections modification can only be made by trained personnel. Local codes must be followed in order to avoid equipment damage, and /or personal injury up to and including death.

[Warning!] Always check that the Genset voltage/connection corresponds to your specific requirements.

- Electrical connections must be carried out in compliance with local codes. AC cables, particularly, must be sized and placed so that the cable does not attain temperatures over 50°C Ambient temperature.
- It is necessary to check that cables have not loosened at the respective terminals.
- To open the control panel front door use the special key supplied with the control panel. Only trained personnel should have access to this key.

4.3.1 GENERATOR TERMINAL BOARD CONNECTIONS:



Modify internal terminal board connections as per above drawing.

4.3.2 CONTROLLER SETUP

Following parameters have to be adjusted – verified on controller set-up:

Menu	Parameter	Adjust to
M02 - General	P0203 – Wiring configuration	L1-N-L2
	P0204 – Nominal voltage (V)	240
M08 – Generator Protection	P0801 – Nom. Gen Current (A)	See following table (Amax)

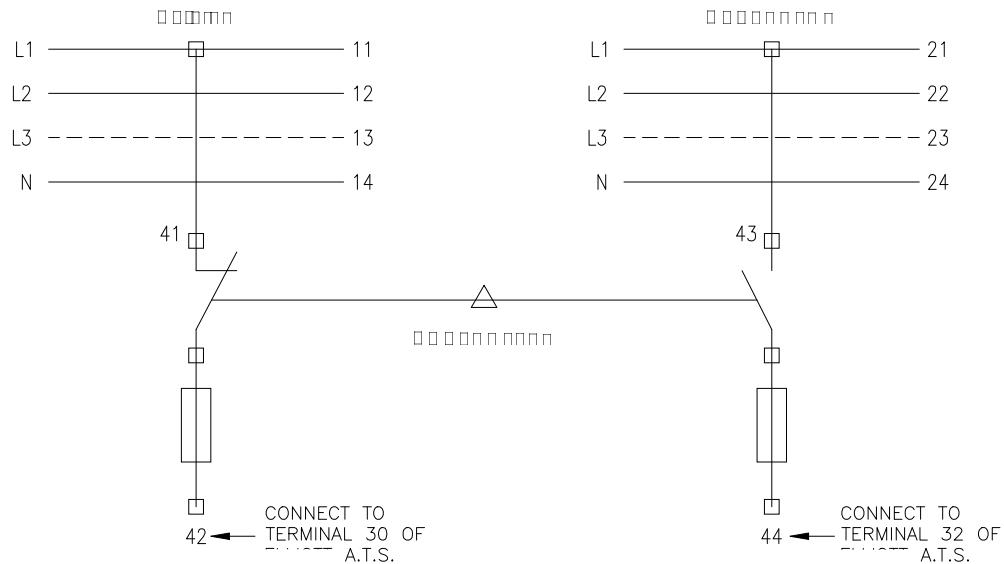
4.3.3 RATED POWER / CURRENT WITH DIFFERENT VOLTAGE

With dog-leg (zig-zag) connection it is possible to obtain:

240 V _{L1-L2} 120 V _{LN}	PO801 Amax	KVA max
GU26L	103	24.6
GU30J	113	27
GU42J	158	38
GU65J	254	61
GU85J	308	74
GU105J	412	99
GU125J	465	111

4.3.4 A.T.S. CONNECTIONS

Te804 controller can control an external A.T.S.: two contacts are available and connected as per following diagram.



[Warning!] Voltage between 42/44 and N must be 120V.

In case of use of an No Logic A.T.S. it is necessary to consider:

- Terminal 42 (UTILITY ON) has to be connected to terminal 30 of ATS
- Terminal 44 (GENSET ON) has to be connected to terminal 32 of ATS

4.3.5 VOLTAGE ADJUSTMENT

Carefully start the generating set and:

- 1 Check ph-ph and ph-N voltage: values between phases-neutral has not to be different (max difference= 2%)
- 2 Quickly adjust output voltage on "VOLT" potentiometer on generator A.V.R
- 3 If output voltage is not inside preset limits before the preset time expires, you will get an alarm.

4.4 HIGH DELTA CONNECTIONS 240V 3ph - 120/240V 1ph

In order to obtain this connection it is necessary to proceed according to the following points.
Do not run the generating set before all these steps have been done.

[Warning!] Internal connections modification can only be made by trained personnel. Local codes must be followed in order to avoid equipment damage, and /or personal injury up to and including death.

[Warning!] Always check that the Genset voltage/connection corresponds to your specific requirements.

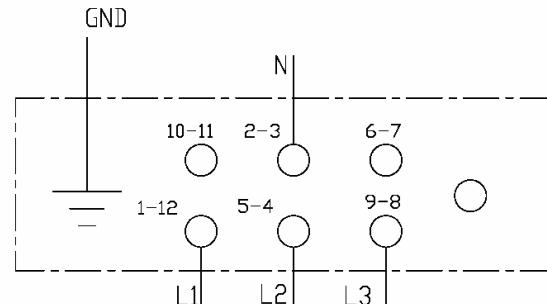
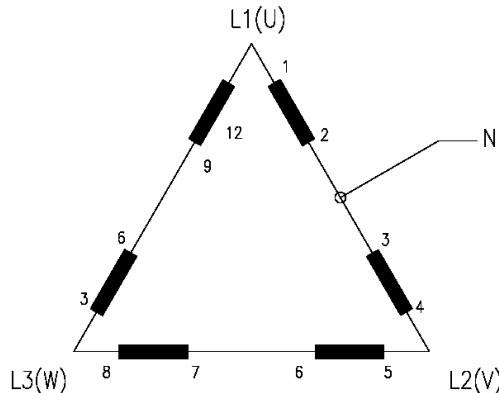
- Electrical connections must be carried out in compliance with local codes. AC cables, particularly, must be sized and placed so that the cable does not attain temperatures over 50° C Ambient temperatures.
- It is necessary to check that cables have not loosened at the respective terminals.
- To open the control panel front door use the special key supplied with the control panel. Only trained personnel should have access to this key.

4.4a HIGH DELTA CONNECTIONS 240V 3ph - 120/240V 1ph

In order to obtain this connection it is necessary to proceed according to the following points.
Do not run the generating set before all these steps have been done.

- [Warning!]** Internal connections modification can only be made by trained personnel. Local codes must be followed in order to avoid equipment damage, and /or personal injury up to and including death.
- [Warning!]** Always check that the Genset voltage/connection corresponds to your specific requirements.
- Electrical connections must be carried out in compliance with local codes. AC cables, particularly, must be sized and placed so that the cable does not attain temperatures over 50°C Ambient temperature.
- It is necessary to check that cables have not loosened at the respective terminals.
- To open the control panel front door use the special key supplied with the control panel. Only trained personnel should have access to this key.

4.4.1 GENERATOR TERMINAL BOARD CONNECTIONS:



Modify internal terminal board connections as per above drawing.

4.4.2 CONTROLLER SETUP

Following parameters have to be adjusted – verified on controller set-up:

Menu	Parameter	Adjust to
M02 – General	P0203 – Wiring configuration	240 3ph: L1-L2-L3 120/240V 1ph: L1-N-L2
	P0204 – Nominal voltage (V)	240
M08 – Generator Protection	P0801 – Nom. Gen Current (A)	See following table (Amax)

4.4.3 RATED POWER / CURRENT WITH DIFFERENT VOLTAGE

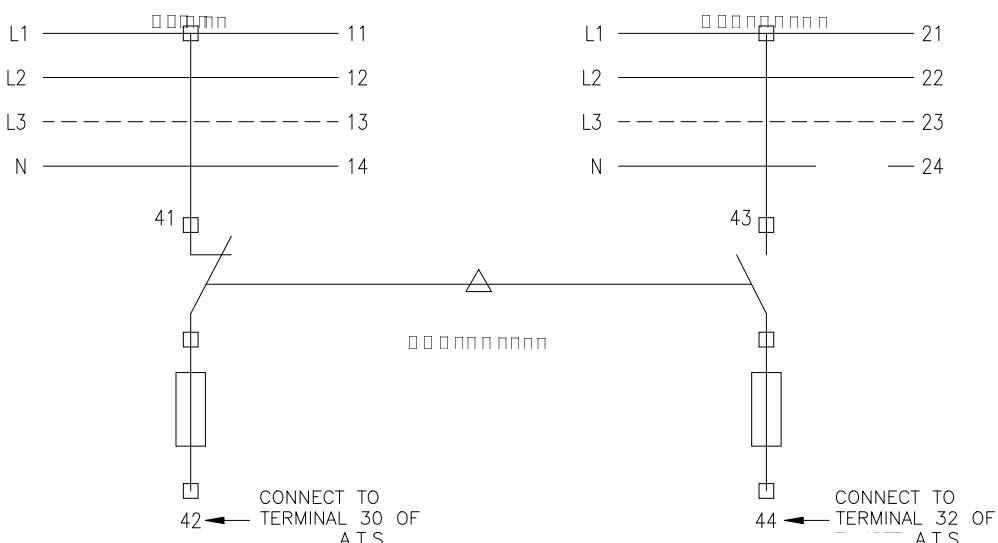
High delta connection Program values

1ph L1-N-L2- 240V _{L1-L2}	PO801 Amax 240V _{L1-L2}	120 V _{LN} Current	KVA max
GU26L	74		17.8
		37	4.4
GU30J	81		19.4
		41	4.9
GU42J	114		27.4
		57	6.8
GU65J	184		44.1
		92	11
GU85J	223		53.5
		111	13.3
GU105J	298		71.5
		149	17.9
GU125J	334		80.1
		167	20

240 V _{LL} 3ph L1-L2-L3	PO801 Amax	KVA max
GU26L	74	30.7
GU30J	81	33.6
GU42J	114	47.3
GU65J	184	76.4
GU85J	223	92.5
GU105J	298	123.7
GU125J	334	138.8

4.4.4 A.T.S. CONNECTIONS

Te804 controller can control an external A.T.S.: two contacts are available and connected as per following diagram.



[Warning!] Voltage between 42/44 and N must be 120V.

4.4.5 VOLTAGE ADJUSTMENT

Carefully start the generating set and:

1. Check ph-ph and ph-N voltage: values between phase has not to be different (max difference= 2%)
2. Quickly adjust output voltage on "VOLT" potentiometer on generator A.V.R.
3. If output voltage is not inside preset limits before the preset time expires, you will get an alarm.

5.0 ATS CONECTIONS

5.1 How to program the TE804 to operate with an Intelligent ATS

Program the Te 804 as follows:

- Press and hold the Reset button
- Press the “-“ button 2 times
- Press the “+” button 3 times
- Press the “down arrow” button 4 times
- Release the Reset button

This will place you in the Extended Menu

- Scroll down (with the down arrow) to “M06 UTILITY CONTROL
- Press Enter button
- Scroll down to P0612 “MAINS control”
- Right side will read “INTERNAL”
- Press – button and this will change to “OFF”
- Press the EXIT button

You have now turned off the internal ATS control

- Scroll down to “M12 Programmable input”
- Press enter
- Scroll down to “P1202 I8.2 Disabled”
- Press the + button 6 times or until the “Disabled” changes to “Remote starting”
- Press enter this will get you into the definition of the input change NA to NO
- Press the Exit button 2 times
-

All the lights will blink and the Te 804 will restart with the changes in place

This has programmed the 8.2 contact to be the remote Start input.

The Remote start contact is 8.2 on the back of the Te 804 controller.

Place the system in AUTO mode

When 8.2 contact is shorted to ground the unit will start and run

When 8.2 is disconnected from ground the unit will shut down

Auto exercise will be enabled when the unit is in the AUTO mode

How to connect the Te 804 to the no-logic ATS

3 Phase ATS Interconnection diagram (Z)

